

# APPENDIX

## UNITS CONVERSION FACTORS

**TABLE A1   Units of Distance**

To convert	To	Multiply by
ft	in	12
ft	m	0.3048
in	ft	1/12
in	mm	25.40
m	ft	3.281
mm	in	0.03937

**TABLE A2   Units of Force**

To convert	To	Multiply by
k	kN	4.448
k	lb	1000
kg <sub>f</sub>	lb	2.205
kg <sub>f</sub>	N	9.807
kg <sub>f</sub>	metric ton	0.001
kN	k	0.2248
lb	k	0.001
lb	kg <sub>f</sub>	0.4536
lb	N	4.448
lb	ton (short)	1/2000
lb	ton (long)	1/2240
N	kg <sub>f</sub>	0.1020
N	lb	0.2248
ton (short)	lb	2000
ton (long)	lb	2240
metric ton	kg <sub>f</sub>	1000

**TABLE A3 Units of Volume**

To convert	To	Multiply by
ft <sup>3</sup>	gal	7.481
gal	ft <sup>3</sup>	0.1337

**TABLE A4 Units of Stress and Pressure**

To convert	To	Multiply by
Atmosphere	lb/ft <sup>2</sup>	2117
Atmosphere	kPa	101.3
bar	kPa	100
kg <sub>f</sub> /cm <sup>2</sup>	kPa	98.07
kg <sub>f</sub> /cm <sup>2</sup>	lb/ft <sup>2</sup>	2048
kPa	atmosphere	0.009869
kPa	bar	0.01
kPa	kg <sub>f</sub> /cm <sup>2</sup>	0.0102
kPa	lb/ft <sup>2</sup>	20.89
kPa	lb/in <sup>2</sup>	0.1450
kPa	metric ton/m <sup>2</sup>	0.1020
lb/ft <sup>2</sup>	atmosphere	$4.725 \times 10^{-4}$
lb/ft <sup>2</sup>	kPa	0.04787
lb/ft <sup>2</sup>	lb/in <sup>2</sup>	1/144
lb/in <sup>2</sup>	kPa	6.895
lb/in <sup>2</sup>	lb/ft <sup>2</sup>	144
lb/in <sup>2</sup>	MPa	$6.895 \times 10^{-3}$
metric ton/m <sup>2</sup>	kPa	9.807
MPa	lb/in <sup>2</sup>	145.0

**TABLE A5 Units of Unit Weight**

To convert	To	Multiply by
kN/m <sup>3</sup>	lb/ft <sup>3</sup>	6.366
kN/m <sup>3</sup>	metric ton/m <sup>3</sup>	0.1020
kN/m <sup>3</sup>	Mg <sub>f</sub> /m <sup>3</sup>	0.1020
lb/ft <sup>3</sup>	Mg <sub>f</sub> /m <sup>3</sup>	0.1020
metric ton/m <sup>3</sup>	kN/m <sup>3</sup>	9.807
Mg <sub>f</sub> /m <sup>3</sup>	kN/m <sup>3</sup>	9.807